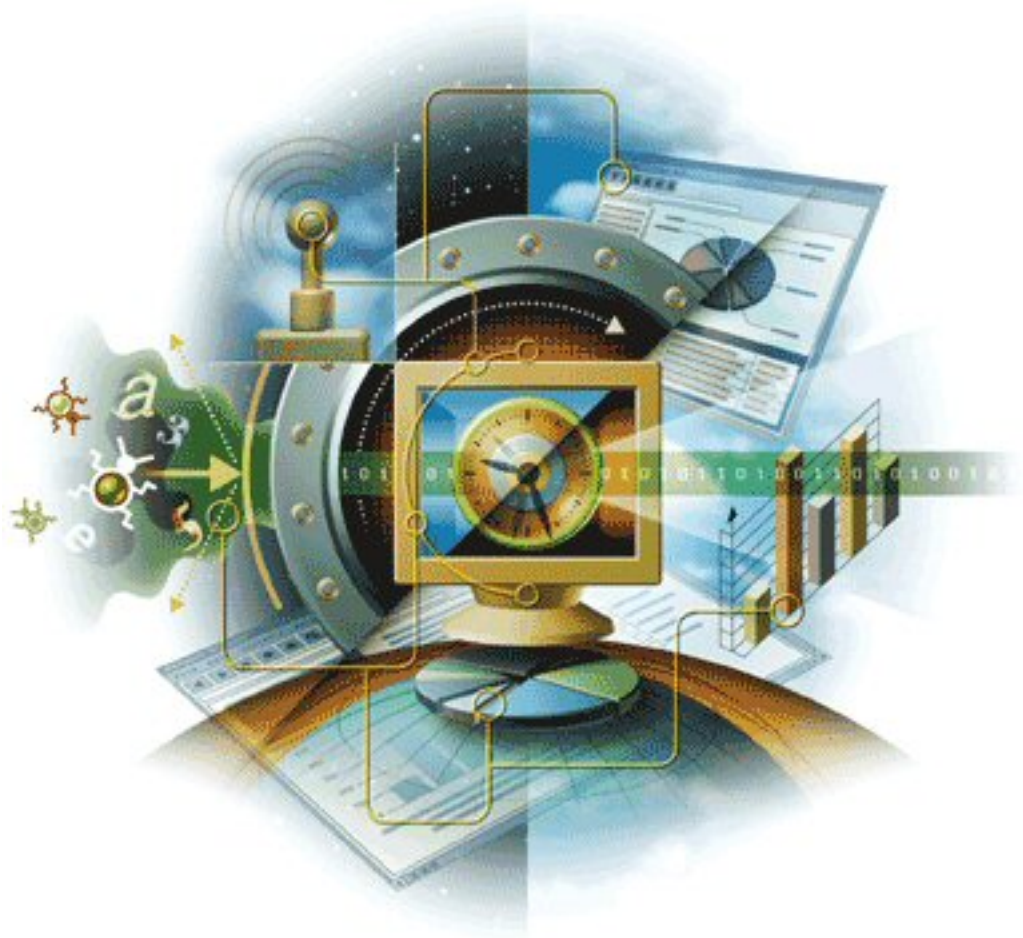
McAfee® IntruShield® IPS

IntruShield M-6050 Sensor
version 4.1



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Preface

This preface provides a brief introduction to McAfee IntruShield, discusses the information in this document, and explains how this document is organized. It also provides information such as the supporting documents for this guide and how to contact McAfee Technical Support.

Introducing McAfee IntruShield IPS

McAfee IntruShield delivers the most comprehensive, accurate, and scalable network IPS solution for mission-critical enterprise, carrier, and service provider networks, while providing unmatched protection against spyware and known, zero-day, and encrypted attacks.

IntruShield combines real-time detection and prevention to provide the most comprehensive and effective network IPS in the market.

What do you want to do?

- Learn more about McAfee IntruShield components.
- Learn how to get started.
- Learn about the Home page and interaction with the Manager interface.

About this guide

This guide contains information necessary to setup your M-6050 sensor model. This information includes guiding you through preconfiguring, cabling, and troubleshooting your sensor. See the Related Documents section for a list of other product documentation that covers topics ranging from planning and deployment to best practices for your environment.

Audience

This guide is intended for use by network technicians and maintenance personnel responsible for installing, configuring, and maintaining sensors, but is not necessarily familiar with IPS-related tasks, the relationship between tasks, or the commands necessary to perform particular tasks.

Contents of this guide

This guide is organized as follows:

- Chapter 1: Overview describes the features and port configurations of the M-6050 sensor, including descriptions of the front panel LEDs.

- Chapter 2: Before You Install contains system specifications, and the safety and usage requirements for the sensors.
- Chapter 3: Setting up an M-6050 describes the preliminary steps you must follow prior to configuring the sensor.
- Chapter 4: Attaching Cables to the M-6050 Sensor describes how to attach network, monitoring, configuration, and response cables to the sensor, and how to cable the sensor to operate in various operating modes.
- Chapter 5: Troubleshooting provides basic information to help you assess possible installation problems that could occur.
- Appendix A: Sensor Technical Specifications provides a physical description (such as dimensions) as well as operating and environmental requirements.
- Appendix B: Information on regulatory, compliance, and other safety requirements.

Contacting Technical Support

If you have any questions, contact McAfee for assistance:

Online

Contact McAfee Technical Support http://mysupport.mcafee.com.

Registered customers can obtain up-to-date documentation, technical bulletins, and quick tips on McAfee's 24x7 comprehensive KnowledgeBase. In addition, customers can also resolve technical issues with the online case submit, software downloads, and signature updates.

Phone

Technical Support is available 7:00 A.M. to 5:00 P.M. PST Monday-Friday. Extended 24x7 Technical Support is available for customers with Gold or Platinum service contracts. Global phone contact numbers can be found at McAfee Contact Information http://www.mcafee.com/us/about/contact/index.html page.

Note: McAfee requires that you provide your GRANT ID and the serial number of your system when opening a ticket with Technical Support. You will be provided with a user name and password for the online case submission.

Related documentation

For information to assist you in hardware setup, installation, and configuration, see the following related documents:

- Sensor Configuration—using the Manager
- Sensor Configuration Guide—using CLI
- Sensor Configuration Guide—using the Wizard

For information to assist you planning for IntruShield IPS deployment and operation, see the following related documents:

- Planning and Deployment Guide

- Special Topics Guide
  - Database Tuning
  - Best Practices
  - Denial-of-Service
  - Sensor High Availability
  - Custom Roles Creation
  - In-line Sensor Deployment
  - Virtualization
- Troubleshooting Guide
- Release Notes

Additionally, you might want to refer to the Getting Started Guide or various configuration guides.

Conventions used in this guide

This document uses the following typographical conventions:

Convention	Example
Terms that identify fields, buttons, tabs, options, selections, and commands on the User Interface (UI) are shown in Arial Narrow bold font.	The Service field on the Properties tab specifies the name of the requested service.
Menu or action group selections are indicated using a right angle bracket.	Select My Company > Admin Domain > View Details.
Procedures are presented as a series of numbered steps.	1. On the Configuration tab, click Backup.
Names of keys on the keyboard are denoted using UPPER CASE.	Press ENTER.
Text such as syntax, keywords, and values that you must type exactly are denoted using `Courier New` font.	Type: `setup` and then press ENTER.
Variable information that you must type based on your specific situation or environment is shown in *italics*.	Type: *sensor-IP-address* and then press ENTER.
Parameters that you must supply are shown enclosed in angle brackets.	`set sensor ip <A.B.C.D>`
Information that you must read before beginning a procedure or that alerts you to negative consequences of certain actions, such as loss of data is denoted using this notation.	**Caution:**

Convention	Example
Information that you must read to prevent injury, accidents from contact with electricity, or other serious consequences is denoted using this notation.	**Warning:**
Notes that provide related, but non-critical, information are denoted using this notation.	**Note:**

CHAPTER 1

Overview

This chapter provides an introduction to IntruShield sensors.

About IntruShield sensors

IntruShield sensors are high-performance, scalable, and flexible content processing appliances built for the accurate detection and prevention of intrusions, misuse, and distributed denial of service (DDoS) attacks.

IntruShield sensors are specifically designed to handle traffic at wire speed, efficiently inspect and detect intrusions with a high degree of accuracy, and flexible enough to adapt to the security needs of any enterprise environment. When deployed at key network access points, an IntruShield sensor provides real-time traffic monitoring to detect malicious activity and respond to the malicious activity as configured by the administrator.

Once deployed and once communication is established, sensors are configured and managed using the central IntruShield ISM server.

The process of configuring a sensor and establishing communication with the ISM is described in later chapters of this guide. The IntruShield ISM server is described in detail in the Getting Started Guide.

Sensor functionality

The primary function of an IntruShield sensor is to analyze traffic on selected network segments and to respond when an attack is detected. The sensor examines the header and data portion of every network packet, looking for patterns and behavior in the network traffic that indicate malicious activity. The sensor examines packets according to user-configured policies, or rule sets, which determine what attacks to watch for, and how to respond with countermeasures if an attack is detected.

If an attack is detected, a sensor responds according to its configured policy. Sensors can perform many types of attack responses, including generating alerts and packet logs, resetting TCP connections, “scrubbing” malicious packets, and even blocking attack packets entirely before they reach the intended target.

Network topology considerations

Deployment of an IntruShield IPS requires knowledge of your network to help determine the level of configuration and amount of installed sensors and ISMs required to protect your system.

The IntruShield sensor is purpose-built for the monitoring of traffic across one or more network segments. For more information on IntruShield, see the Getting Started Guide.

Following is an example of a network topology using Gigabit Ethernet throughput. In the illustration, IntruShield provides IPS and Alert Viewer protection to outsourced servers. High port-density and virtualization provides a highly scalable solution, while IntruShield protects against Web and eCommerce mail server exploits.

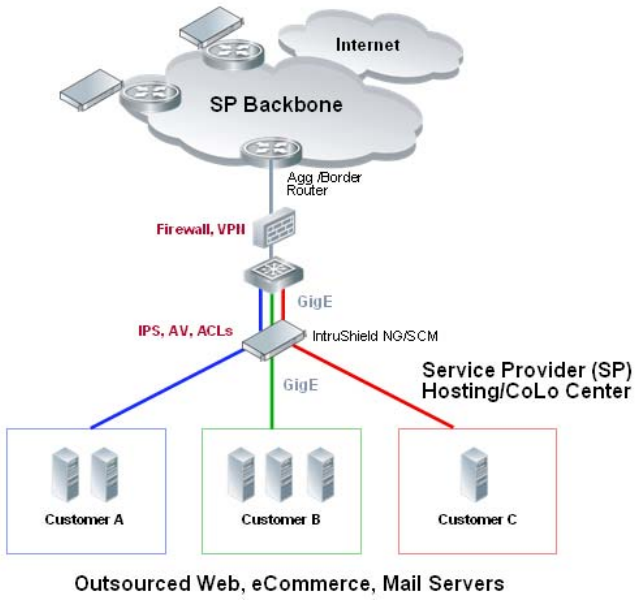

Figure 1: Service Provider Data Center-based Deployment

M-6050 key features

The M-6050 sensor includes the following features:

- 8 10-GbE XFP
- 8 SFP ports (10/100/1000 copper or 1 GbE fiber)
- 1 10/100/1000 Base-T Management port
- 1 Response port
- Hot-swappable SFP/XFP modules
- Dual power supply
- 3 Fan units (that are field replaceable)

M-6050 physical description

The high-port density IntruShield M-6050, designed for high bandwidth links, is equipped to support four 10 Gigabit full-duplex Ethernet segments or eight 10 Gigabit SPAN ports transmitting aggregated traffic. Additionally, it supports four 1 Gigabit

dull-duplex Ethernet segments or eight 1 Gigabit SPAN ports transmitting aggregated traffic.

Ports

The M-6050 is a 2RU unit and is equipped with the following components:

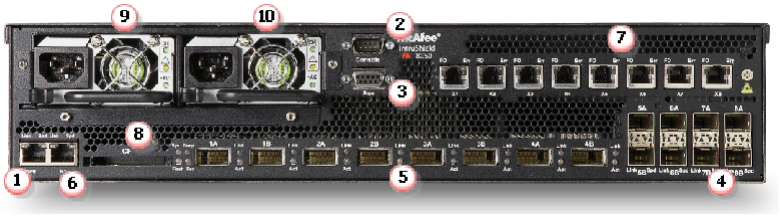

Figure 2: M-6050 sensor

Name	Description
1	Management port
2	Console port
3	Auxiliary port
4	SFP Gigabit Ethernet Monitoring ports
5	XFP Gigabit Ethernet Monitoring ports
6	Response port
7	Fail-Open Control ports
8	External Compact Flash port
9	Power Supply A
10	Power Supply B

1 One RJ-45 10/100/1000 Management port, which is used for communication with the Manager server. You can assign an IP address to this port during installation.

2 One RS-232C Console port, which is used to set up and configure the sensor.

3 One RS-232C Auxiliary port, which may be used to dial in remotely to set up and configure the sensor.

4 Eight small form-factor pluggable (SFP) 1 Gigabit Monitoring ports, which enable you to monitor eight SPAN ports, four full-duplex tapped segments, four segments in-line, or a combination (that is, two full-duplex segment, four SPAN ports).

The Monitoring interfaces of the M-6050 work in stealth mode, meaning they have no IP address and are not visible on the monitored segment.

5 Eight 10 Gigabit small form-factor pluggable (XFP) 10 Gigabit Monitoring ports, which enable you to monitor eight SPAN ports, four full-duplex tapped segments, four segments in-line, or a combination (that is, two full-duplex segment, four SPAN ports).

The Monitoring interfaces of the M-6050 work in stealth mode, meaning they have no IP address and are not visible on the monitored segment.

If you choose to run in failover mode, port 4A is used to interconnect with a standby sensor.

Note: The gigabit ports of the M-6050 running in In-line Mode fail closed, meaning that if the sensor fails, it will interrupt/block data flow. Fail-open functionality requires either the Layer 2 Passthru feature, described in detail in the Sensor Configuration Guide—using ISM or the hardware Gigabit Fail-Open Bypass kit for Gigabit ports, described in *Cabling the failover interconnection ports* section.

6 One RJ-45 Response port, which, when you're operating in SPAN or TAP mode, enables you to inject response packets back through a switch or router.

7 Eight RJ-11 Fail-Open Control ports, designed for use with the Optical Fail-Open Bypass kit. The ports are marked X1, X2, X3, X4, X5, X6, X7, and X8 and are used in conjunction with ports 1A/1B, 2A/2B, 3A/3B, 4A/4B, 5A/5B, 6A/6B, 7A/7B, and 8A/8B, respectively.

8 One External Compact Flash port. This port is used for two purposes. It is used to control optional fail-open hardware as described in the Gigabit Optical Fail-Open Bypass Kit Quick Guide. It is also used in troubleshooting situations where the sensor's internal flash is corrupted and you must reboot the sensor using the external compact flash. For more information, see the on-line KnowledgeBase at https://mysupport.mcafee.com.

9 Power Supply A (included). Power supply A is included with each sensor. The supply uses a standard IEC port (IEC320-C13). The supply uses a standard IEC port (IEC320-C13). McAfee provides a standard, 2m NEMA 5-15P (US) power cable (3 wire). International customers must procure a country-appropriate power cable.

10 Power Supply B (optional, purchased separately). Power supply B is a hot-swappable, redundant power supply. This power supply also uses a standard IEC320-C13 port, and you can use the McAfee-provided cable or acquire one that meets your specific needs.

The M-6050 does not have internal taps; it must be used with a third-party external tap to run in tapped mode.

Front panel LEDs

The front panel LEDs provide status information for the health of the sensor and the activity on its ports. Table 1-1 describes the M-6050 front panel LEDs.

LED	Status	Description
Pwr A (Power A) • OK • ⚠ • ~AC	 Green Amber Green	 Power Supply A is functioning. Power Supply A is not functioning. Power Supply in AC mode.
Pwr B (Power B) • OK • ⚠ • ~AC	 Green Amber Green	 Power Supply B is functioning. Power Supply B is not functioning. Power Supply in AC mode.
Note: If a power supply is not present, both green and amber LEDs are off.		
Management Port Speed	Green Amber Off	The port speed is 1000 Mbps. The port speed is 100 Mbps. The port speed is 10 Mbps.
Management Port Link	Green Off	The link is connected. The link is disconnected.
Sys	Green Amber	Sensor is operating. Sensor is booting. (It could also indicate a system failure.)
Fan	Green Amber	All three fans are operating. One or more of the fans has failed.
Temp	Green Amber	Inlet air temperature measured inside chassis is normal. (Chassis temperature OK.) Inlet air temperature measured inside chassis is too hot. (Chassis temperature too hot.)
Flash	Green Off	Activity on external compact flash. (For example, the Fail-Open Controller has been inserted.) No activity on external compact flash.
Gigabit Ports Act	Amber Off	Data transferring. No data transferring.
Gigabit Ports Link	Green Off	The link is connected. The link is disconnected.
Response Port Speed	Green Amber Off	The port speed is 1000 Mbps. The port speed is 100 Mbps. The port speed is 10 Mbps.
Response Port Link	Green Off	The link is connected. The link is disconnected.

LED	Status	Description
Fail-Open Control Port Speed	Green	The link is enabled.
	Off	The link is disabled.
Fail-Open Control Port Link	Amber	There is an error.
	Off	There is no error.

CHAPTER 2

Before You Install

Usage Restrictions

The following restrictions apply to the use and operation of an IntruShield sensor:

- You may not remove the outer shell of the sensor. Doing so will invalidate your warranty.
- The sensor appliance is not a general purpose workstation.
- McAfee prohibits the use of the sensor appliance for anything other than operating the IntruShield IPS.
- McAfee prohibits the modification or installation of any hardware or software in the sensor appliance that is not part of the normal operation of the IntruShield IPS.

Safety measures

Please read the following warnings before you install the product. These safety measures apply to all sensor models unless otherwise noted.

Failure to observe these safety warnings could result in serious physical injury.

Warnings:

- Read the installation instructions before you connect the system to its power source.
- To remove all power from the M-6050 sensor, unplug all power cords, including the redundant power cord.
- Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
- Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.
- This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.
- Do not remove the outer shell of the sensor. Doing so will invalidate your warranty.
- Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Blank faceplates and cover panels prevent exposure to hazardous voltages and currents inside the chassis, contain electromagnetic interference (EMI) that might disrupt other equipment, and direct the flow of cooling air through the chassis.

- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Refer to Appendix B for information on regulatory, compliance, and other safety requirements.

Working with Fiber-Optic ports

The IntruShield M-6050 sensor uses fiber-optic connectors for its 16 Monitoring ports. The connector type is a Small Form-factor Pluggable (SFP) fiber optic connector that is LC-Duplex compatible.

- Fiber-optic ports (for example, SFP/XFP, FDDI, OC-3, OC-12, OC-48, ATM, GBIC, and 100BaseFX) are considered Class 1 laser or Class 1 LED ports.
- These products have been tested and found to comply with Class 1 limits of IEC 60825-1, IEC 60825-2, EN 60825-1, EN 60825-2, and 21CFR1040.

Warning: To avoid exposure to radiation, do not stare into the aperture of a fiber-optic port. Invisible radiation might be emitted from the aperture of the port when no fiber cable is connected.

- Only FDA registered, EN 60825-1 and IEC 60825-1 certified Class 1 SFP laser transceivers are acceptable for use with the M-6050 sensor.

Contents of the box

The following accessories are shipped in the M-6050 sensor box:

- One sensor.
- One power supply.
- Two CD ROMS containing the sensor software and on-line documentation.
- Power cords. McAfee provides a standard and international power cables.
- One set of rack mounting rails.
- One set of rack mounting ears.
- One printed slide rail assembly procedure.
- One printed quick start guide.
- Release notes.

Unpacking the sensor

To unpack the sensor:

1. Place the sensor box as close to the installation site as possible.
2. Position the box with the text upright.
3. Open the top flaps of the box.
4. Remove the accessory box.
5. Verify you have received all parts. These parts are listed on the packing list and in Contents of the sensor box.
6. Pull out the packing material surrounding the sensor.
7. Remove the sensor from the anti-static bag.
8. Save the box and packing materials for later use in case you need to move or ship the sensor.

CHAPTER 3

Setting up an M-6050

This chapter describes the process of setting up a sensor to prepare it for configuration.

Setup Overview

Setting up a sensor involves the following steps:

1. Positioning the sensor. (See below.)
2. Installing interface modules (SFP and XFP).
3. Attaching power, network, and monitoring cables. (See Attaching Cables to the M-6050 sensor.)
4. Powering on the sensor. (See Powering on the sensor.)

Once you have set up and powered on the sensor, you can proceed with configuration.

Positioning the sensor

Place the sensor in a physically secure location, close to the switches or routers it will be monitoring. Ideally, the sensor should be located within a standard communications rack.

The M-6050 is a 2RU (2 rack unit).

To mount the sensor in a rack, you will attach two mounting ears and rails to the sensor as described below.

Installing the rails and ears on the chassis and rack

Caution: Before you install the rails and ears on the chassis, make sure that power is OFF. Remove the power cable and all network interface cables from the sensor.

Each rack-mounting rail and ear has holes that match up with holes in the chassis.

To install the rails and ears on the chassis, follow these steps—using a Phillips screwdriver to secure the Phillips flathead screws:

1. Verify that you have all the parts you will need: two three-in-one rails, two chassis ears, and fourteen Phillips flathead screws. Each rail includes a rail that mount to the rack, a rail that slides into the mounted rail, and a rail that is attached to the chassis.

2 Disassemble the slide rail by pulling the inner rail out and pushing the side latch in to separate.

3 Attach the inner rail to the chassis by fastening it with the screws provided.

4 Attach the ear to each side of the chassis.

5 Mount L-shape and external rail to your rack frame. The adjustable end of the L-shape rail is intended for placement at the back of your rack. Adjust the rail as needed for length.

You are now ready to mount the sensor in the rack.

Mounting a sensor in a rack

McAfee recommends rack-mounting your sensors. The rack-mounting hardware included with the sensors is suitable for most 19-inch equipment racks and telco-type racks. For maintenance purposes, you should have access to the front and rear of the sensor.

Caution: Before you mount the sensor in the rack, make sure that power is OFF. Remove the power cable and all network interface cables from the sensor

Note: Because of the weight of the appliance, McAfee recommends that two people place the chassis into the rail cabinet.

Insert the chassis into the rail cabinet and complete the rack-mounting of the sensor by securing the rack mount ears to two posts or mounting strips in the rack. The ears secure the sensor to two rack posts. Ensure to fasten the ears securely to the rack. You can also mid-mount the Sensor (optional). For details, refer to M-6050 Quick Start Guide.

Removing a sensor from the rack

Note: Because of the weight of the appliance, McAfee recommends that two people remove the chassis from the rail cabinet.

When removing the chassis from the rack, pull chassis forward until you hear the innermost rails snap in place. On each side of the rails, press in the release button as pictured below and continue pulling the chassis.

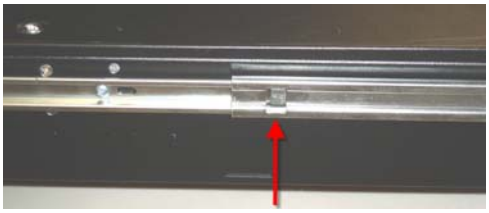

Figure 3: Rail release latch

Using the redundant power supply

A basic configuration of the M-6050 includes one hot swappable supply. You may install a second hot-swappable power supply (purchased separately from McAfee) for redundancy.

Each of these modules has one handle for insertion or extraction from the unit as well as a release latch.

Figure 4: Power supply units

Installing the power supply

To install a power supply in the M-6050:

1. Unpack the power supply from its shipping carton.
2. Remove the faceplate panel covering the power supply slot.

   Note: The faceplate panel should remain in place unless a power supply is in the power supply slot.
3. Do not operate the sensor without the faceplate panel in place.
4. Place the power supply in the slot with the cable outlet facing front and on the left side of the faceplate.

Figure 5: Power supply installation

5. Slide in the power supply until it makes contact with the backplane, then push firmly to mate the connectors solidly with the backplane.

Note: For true redundant operation with the optional redundant power supply, McAfee recommends that you plug each supply into a different power circuit. For optimal protection, use uninterruptable power sources.

Removing the power supply

To remove a power supply from the M-6050 (Optional—the power supplies are hot-swappable):

1. Unplug the power cable from its power source and remove the power cable from the power supply.
2. Put on an antistatic wrist or ankle strap. Attach the strap to a bare metal surface of the chassis.
3. Push the release latch inward toward the handle.
4. Squeeze the handle of the power supply and pull it out.
5. Use faceplate panels to protect unused slots from dust and reduce electromagnetic radiation.
6. Replace the mounting bracket.

Warning 1: To remove all power from the M-6050 sensor, unplug all power cords.

Warning 2: To avoid data interruption, do not power off both power supplies on an in-line sensor, or the sensor shuts down and all data traffic stops. Power off only the power supply you are replacing.

Cabling the sensor

Follow the steps outlined in Attaching Cables to the M-6050 Sensor to connect cables to the monitoring, response, console, and management ports on your sensor.

Using Small Form-factor Pluggable modules

The M-6050 uses two types of Small Form-factor Pluggable modules as shown in the table.

Type	Performance
SPF	10/100/1000 Mbps (copper) 1 Gbps (fiber optic)
XFP	10 Gbps (fiber optic)

Each module is a hot-swappable input/output device that plugs into an LC-type Gigabit Ethernet port, linking the module port with a copper or fiber-optic network. SFP optical interfaces are less than half the size of GBIC interfaces.

Note: To ensure compatibility, McAfee supports only those SFP and XFP modules purchased through McAfee or from a McAfee-approved vendor. For a list of approved vendors, see the on-line KnowledgeBase, https://support.mcafee.com. https://mysupport.mcafee.com

These installation instructions provide information for installing an SFP and an XFP module that uses a bail clasp for securing the module in place in the sensor. Your

module may be slightly different. Check the module manufacturer's installation instructions for more details.

For ease of installation, insert the module in the sensor while it is powered down and before placing it in a rack.

Caution: To prevent eye damage, do not stare into open laser apertures.

Modules Description

This section describes the operating requirements of the SFP and XFP modules.

SFP module

The SFP (Small Form Factor Pluggable) module is a hot-swappable, protocol-independant, compact, optical receiver, which allows for greater port density than the standard GBIC. This module operates at varying speeds for up to 1 Gigabit per second on SONET/SDH, Fibre Channel, Gigabit Ethernet and other applications. The SFP module operates in single mode and multimode. Additionally, this module transmits on a 850-nanometer wavelength on short reach (SR) and 1310-nanometer wavelength on long reach (LR).

Figure 6: SFP Module

XFP module

The supported XFP module is a robust Small Form Factor Pluggable, operating at 850nm, for up to 10 Gigabits per second on SONET/SDH, Fibre Channel, Gigabit Ethernet and other applications. This module operates in single mode and multimode. Additionally, this module transmits on a 850-nanometer wavelength on short reach (SR), and 1310-nanometer wavelength on long reach (LR).

Figure 7: XFP Module

Installing a module

To install a module with a bail clasp, follow these steps:

1. Remove the module from its protective packaging.
2. Ensure the module is the correct model for your network.
3. Locate the label on the module and ensure that the alignment groove is down.

   Note: For SFP modules, turn the module so that its label is on top. For XFP modules, turn the module so that its label is on bottom.
4. Grip the sides of the module with your thumb and forefinger and insert module into the module socket.

   Modules are keyed to prevent incorrect insertion.

Figure 8: Module in Monitoring port

Removing a module

If you are removing a module, follow these steps:

1. Disconnect the network fiber-optic cable from the module.
2. Release the module from the slot by pulling the bail clasp out of its locked position.
3. Slide the module out of the slot.
4. Insert the module plug into the module optical bore for protection.

Power-on the sensor

Warning: Do not attempt to power on the sensor until you have installed the sensor in a rack, made all necessary network connections, and connected the power cable to the power supply.

Connect the power cable to the sensor power supply.

Connect the power cable to a power source.

Note: If you are installing a redundant power supply, you should install it as described in Installing a power supply. For true redundant operation with the optional redundant power supply, McAfee recommends that you plug each supply into a different power circuit.

The M-6050 sensor has no power switch. The sensor powers on as soon as one of its power cables is connected to a power source.

Powering off the sensor

McAfee recommends that you use the shutdown CLI command to halt the sensor before powering it down. For more information on CLI commands, see Sensor Configuration Guide—using CLI.

CHAPTER 4

Attaching Cables to the M-6050

Follow the steps outlined in this chapter to connect cables to the various ports on your sensor.

Cabling the Console port

The Console port is used for setup and configuration of the sensor.

1. For console connections, plug the DB9 Console cable supplied by McAfee into the Console port (labeled Console on the sensor front panel).
2. Connect the other end of the Console port cable directly to a COM port of the PC or terminal server you will use to configure the sensor (for example, a PC running correctly configured Windows HyperTerminal software). You must connect directly to the console for initial configuration.

   Required settings for HyperTerminal are:

Name	Setting
Baud rate	38400
Number of bits	8
Parity	None
Stop bits	1
Flow Control	None

3. Power on the sensor.

Cabling the Auxiliary port

The Auxiliary (Aux) port is also used for modem access to the sensor for setup and configuration.

You cannot use a modem the first time you configure a sensor.

1. For modem connections, plug a straight-through modem cable into the Auxiliary port (labeled Aux on the sensor front panel).
2. Connect a modem to the Aux port.

   Connect a telephone line to the modem.

   Required settings for the Aux port are:

Name	Setting
Baud rate	38400
Number of bits	8
Parity	None
Stop bits	1
Flow Control	None

Cabling the Response port

The sensors' Response ports are used to send responses to attacks; when operating in TAP or SPAN mode, for example, you cannot inject response packets via a tap. You must use a Response port.

► **To connect the Response port to a network device:**

1 Plug a Cat-5e Ethernet cable into the Response port (labeled Rx on the sensor front panel).

2 Connect the other end of the cable to the network device (for example, hub, switch, router) through which you want to respond to attacks.

Cabling the Fail-Open port

Fail-open functionality for the GE Monitoring ports is accomplished using the standard Gigabit Fail-open Bypass Kit, sold separately. (Both Copper and Optical versions are available.)

Fail-open functionality for the 10 Gigabit Monitoring ports is accomplished using the standard 10 Gigabit (Optical) Fail-open Bypass Kit, sold separately.

For more information, see the documentation that accompanies the Kit.

Cabling the Management port

The Management (Mgmt) port is used for communication with the Manager server.

► **To connect the sensor to the Manager server:**

1 Plug a Cat-5e Ethernet cable into the Management port (labeled Mgmt on the sensor front panel).

2 Connect the other end of the cable to the network device (for example, hub, switch, router) that in turn connects to the Manager server.

Note: To isolate and protect your management traffic, McAfee strongly recommends using a separate, dedicated management subnet to interconnect the sensors and the Manager.

Cabling the Monitoring port

Connect to the network devices you will be monitoring via the sensor Monitoring ports. You can deploy sensors in the operating modes shown in the following table. Cabling instructions for the sensor Monitoring ports are shown on the pages indicated.

To cable the M-6050 in this mode...	See...
In-line mode (fail-closed)	Cabling for in-line mode
In-line mode (fail-open)	Using fail-open hardware
External tap mode	Cabling for TAP mode
SPAN or Hub mode	Cabling for SPAN or hub mode
Failover	Cabling the Failover interconnection ports

Using peer ports

All full-duplex sensor deployment modes require the use of two peer monitoring ports on the sensor. On the sensors, the numbered ports are wired in pairs to accommodate the traffic.

The following XFP 10 Gigabit Ethernet ports and SFP Gigabit Ethernet ports are coupled and must be used together:

Port Pairs (and Transceiver Type)
1A and 1B (XFP)
2A and 2B (XFP)
3A and 3B (XFP)
4A and 4B (XFP)
5A and 5B (SFP)
6A and 6B (SFP)
7A and 7B (SFP)
8A and 8B (SFP)

Note: You cannot configure, for example, IA and 2A to work together as a pair.

Figure 9: Port pair

Default monitoring port speed settings

Be sure that the switch/router ports connected to the sensor Monitoring ports match the sensor configuration.

Default monitoring port speed settings

Monitoring Ports	Operating Mode	Speed/Duplex Setting
XFP ports SFP ports	SPAN	Auto-negotiation is ON
	Tap	Auto-negotiation is ON
	In-line	Auto-negotiation is ON

Cable types for routers, switches, hubs, and PCs

The cabling instructions in this chapter

- Use a crossover Ethernet RJ-45 cable to connect a router port to the 10/100/1000 copper SFP Monitoring ports.
- Use a straight-through Ethernet RJ-45 cable to connect a switch/hub port to 10/100/1000 copper SFP Monitoring ports.
- Use a crossover Ethernet RJ-45 cable to connect a router port to PC to the sensor Management port.

Note: You should also use a crossover Ethernet RJ-45 cable to connect a PC to the sensor monitoring port.

Cabling for in-line

The Gigabit Ethernet ports fail closed, meaning they stop the flow of traffic if the sensor fails. To allow traffic to flow uninterrupted, you must use special hardware and cable the sensor for fail-open functionality. For instructions, see the section later in this chapter.

To connect the M-6050's Gigabit Ethernet ports so they fail closed:

1. Plug the cable appropriate for use with your Gigabit Ethernet into one of the ports labeled xA (for example, 1A).
2. Plug another cable into the peer of the port used in Step 1. This port will be labeled xB (for example, 1B).
3. Connect the other end of each cable to the network devices that you want to monitor. (For example, if you plan to monitor traffic between a switch and a router, connect the cable connected to 1A to the switch and the one connected to 1B to the router.)

Cabling for TAP mode

The M-6050 sensor's Gigabit Ethernet ports must be used with a 3rd party external tap.

Note: For a list of approved 3rd party vendors, see the KnowledgeBase at https://mysupport.mcafee.com

External tap mode requires a port pair (for example, 1A and 1B).

To connect the sensor to the devices you want to monitor in external tap mode:

1. Plug the cable appropriate for use with your Gigabit Ethernet port into one of the ports labeled xA (for example, 1A).
2. Plug another cable into the other port labeled xB (for example, 1B).
3. Connect the other end of each cable to the tap.
4. Connect the network devices that you want to monitor to the tap.

Cabling for SPAN or hub mode

For the M-6050 sensor, monitoring in SPAN or hub mode occurs in in-line fail-open mode. When you monitor in SPAN or hub mode, you do not need to use a port pair. You can use single ports. To connect an M-6050 to a SPAN port or hub, plug an LC fiber-optic cable into one of the modules and connect the other end of the cable to the SPAN port or the hub.

Note: See Cable types for routers, switches, hubs, and PCs to determine which cable type to use with which type of network device.

Cabling the Failover interconnection ports

Failover requires connecting two identical M-6050 sensors (same model, same software) using an interconnection cable or cables.

Gigabit ports 4A is the interconnection port on the M-6050. A failover cable is the only additional hardware required to support failover communication between two M-6050 sensors.

To connect two M-6050s for failover:

1. Plug the cable appropriate for use with your XFP module into port 4A of the active sensor.
2. Connect the other end of the cable to port 4A of the standby sensor.

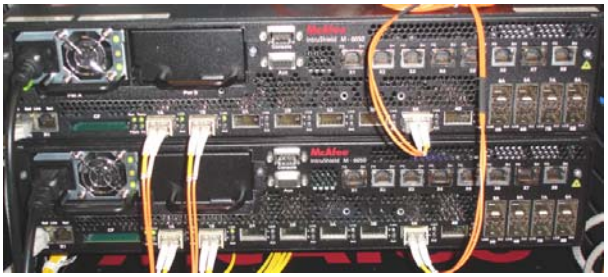

Figure 10: Cabling M-6050 sensors for Failover

Using Fail-Open hardware

The standard Gigabit Fail-Open Kit and the 10 Gigabit Fail-Open Kit (sold separately) minimizes the potential risks of in-line IntruShield sensor failure on critical network links. Both Copper and Optical versions of the Kit are available for 1 Gigabit ports. A 10 Gigabit Optical Kit is also available for the 10 Gigabit ports.

The Monitoring ports on IntruShield sensors fail closed; thus, if the sensor is deployed in-line, a hardware failure results in network downtime. Fail-open operation for the Monitoring ports requires the use of the optional external Bypass Switch provided in the Kit.

With the Bypass Switch in place, normal sensor operation supplies power to the switch via a control cable. While the sensor is operating, the switch is “on” and routes all traffic directly through the sensor. When the sensor fails, the switch automatically shifts to a bypass state: in-line traffic continues to flow through the network link, but is no longer routed through the sensor. Once the sensor resumes normal operation, the switch returns to the “on” state, once again enabling in-line monitoring.

Caution 1: Note that sensor outage breaks the link connecting the devices on either side of the sensor for a brief moment and requires the renegotiation of the network link between the two peer devices connected to the sensor. Depending on the network equipment, this disruption introduced by the renegotiation of the link layer between the two peer devices may range from a couple of seconds to more than a minute with certain vendors’ devices.

Caution 2: A very brief link disruption may also occur while the links between the sensor and each of the peer devices are renegotiated to place the sensor back in in-line mode. This outage, again, varies depending on the device, and can range from a few seconds to more than a minute.

Installation and troubleshooting instructions for the Kit can be found in the Quick Guide that accompanies the kit. For example, for more information on the Optical kit, see the standard Gigabit Optical Fail-Open Bypass Kit Guide.

CHAPTER 5

Troubleshooting

This section lists some common installation problems and their solutions.

Problem	Possible Cause	Solution
LED is off.	The control cable has been disconnected.	Check the control cable and ensure it is properly connected to both the sensor and the Bypass Switch.
LED is off.	The sensor is powered off.	Restore sensor power.
LED is off.	The sensor port cable is disconnected.	Check the sensor cable connections.
Sensor is operational, but is not monitoring traffic.	Network device cables have been disconnected.	Check the cables and ensure they are properly connected to both the network devices and the Bypass Switch.
Sensor is operational, but is not monitoring traffic.	The sensor ports have not been enabled in the Manager.	The sensor will not monitor traffic on the ports unless the ports are enabled in the Manager. Ports are disabled in a sensor failure; they must be re-enabled for sensor monitoring to resume.
Network or link problems.	Improper cabling or port configuration.	Ensure that the transmit and receive cables are properly connected to the Bypass Switch.
Runts or giants errors on switch and routers.	Improper cabling or port configuration.	Ensure that the transmit and receive cables are properly connected to the Bypass Switch.
The system fault “Switch absent” appears in the Manager System Health window.	The control cable has been disconnected.	Check the control cable and ensure it is properly connected to both the sensor and the Bypass Switch.

APPENDIX A

Sensor Technical Specifications

The following table lists the specifications of the M-6050 sensor.

Sensor Specifics	Description
Dimensions	Without mounting ears/rails/cable management: • Width: 16.75 in. (41.91 cm) • Height: 3.5 in. (8.89 cm) • Depth: 30.00 in. (76.20 cm) Dimensions do not include cables or power cords.
Weight	47 lbs (21.31 kg)
Voltage Range	100-240VAC
Frequency	50/60Hz
Vibration, operating	Sinusoidal: 3 to 500 Hz @ 0.15 gpk Random: 2.5 to 200 Hz @ 0.33 g
Vibration, non-operating	Sinusoidal: 10 to 500 Hz @ 0.8 gpk Random: 2.5 to 200 Hz @ 1.05 g
Power requirements	450W
Temperature	
Ambient Temperature Range (Non-condensing)	Operating 0C(32F) to 35C(95F) Non-operating -40C(-40F) to 70C(158F)
Relative Humidity (Non-condensing)	Operating 5%-90% non-condensing Non-operating 5% to 95% non-condensing
Sensor Specifics	
System Heat Dissipation	AC (max): 535W, 1825 BTU/hr DC (max): To Be determined
Airflow	200 lfm (1 m/s)
Altitude	Sealevel to 10,000 ft (3050m)

APPENDIX B

Regulatory, Compliance, and Safety Information

The M-6050 meets the following standards:

Sensor Regulatory, Safety, and Compliance	
Regulatory	
	Products with the CE Marking are compliant with the 89/336/EEC and 73/23/EEC directives, which include the safety and EMC standards listed.
Safety certification:	
	EN 55024: 1998 + A1:2001 + A2: 2003 - Immunity: • EN-61000-4-2: ESD Immunity • EN-61000-4-3: Radiated Immunity • EN-61000-4-4 EFT/B Immunity • EN-61000-4-5: Surge Protection • EN-61000-4-6: Conducted Immunity EN-61000-4-11: Voltage Interruption/Dips (N/A for DC)
	CISPR/KN22 • KN-61000-4-2: ESD Immunity • KN-61000-4-3: Radiated Immunity • KN-61000-4-4 EFT/B Immunity • KN-61000-4-5: Surge Protection • KN-61000-4-6: Conducted Immunity • KN-61000-4-11: Voltage Interruption/Dips (N/A for DC)
Electromagnetic compliance (emissions):	
	FCC Part 15 Class A/Industry Canada ICES-003 Issue 4, February 7, 2004 Class A
	VCCI V-1/93.11, V-2/97.04, V-4/97 Class A
	AS/NZS CISPR22: 2004 Class A
	CNS 13438: May 1997

Sensor Regulatory, Safety, and Compliance	
	SS IEC CISPR22: 1993, Singapore IDA Class A
	EN 55024: 1998 + A1:2001 + A2: 2003 - Emissions: • Radiated Emissions • Conducted Emissions • EN 61000-3-2: 2000 Harmonic Current Emissions • EN 61000-3-3: 1995 + A1: 2001 Voltage Fluctuation/Flicker
	CISPR/KN22 • Radiated Emissions • Conducted Emissions

APPENDIX C

Sensor Capacity

The following table lists the sensor's capacity to handle data operations within the following categories:

Operation Type	Maximum Capacity
Concurrent connections	1,000,000
Connections established per sec.	25,000
Concurrent SSL Flows (2.1.x and later)	100,000
Number of SSL keys that can be stored on the sensor	64
Virtual IDS sessions	1000
Virtual Interfaces (VIDS)	1000
VLANS / CIDR Blocks	3000
VLANS / CIDR Blocks per Physical Port	254
Customized attacks	100,000
Alert filters	128,000
Default number of supported UDP Flows	100,000
Supported UDP Flows	750,000
DoS Profiles	5000
SYN rate (64-byte packets per second)	1,000,000
ACL Rules (refer to note below)	1000